NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 003/02

APRIL 15, 2002

File With Nautical Chart Manual Volume 1, Part 2, Section 5.30

TO: All Cartographers
Marine Chart Division

SUBJECT: Nautical Chart Manual NOS/ENC Object Specifications: Navigational Aids-
General Encoding Information

APPLICATION: All Nautical Charts

Effective immediately, the following attachment introduces to the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition Section, Section 5.30 - National Ocean Service/Electronic Navigational Charts Object Specifications - Navigational Aids.

The attachment includes Section 5.30's "blue card" containing the title information of the section, page 5-i containing the section's Preface and pages 5-Intro_1 through 5-Intro_30 which contain general information pertaining to the ENC encoding of NOS navigational aids..

Section 5.30's "blue card" and pages 5-i through 5-Intro_30 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after page 5-50.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

Section 5.30

National Ocean Service/Electronic Navigational Charts Object Specifications

[Navigational Aids

APRIL 15, 2002

Section 5.30

Preface

The information provided in the *NOS/ENC Object Specifications* represents the National Ocean Service's interpretation of the object encoding guidelines presented in the *IHO/S-57 Appendix B.1, ENC Product Specification, Annex A - Use of the Object Catalogue for ENC*. All information in the *NOS/ENC Object Specifications* is intended to assist the NOS nautical cartographer not only in the creation of an IHO/S-57 compliant ENC database but also in the application of all previously established but appropriate NOS charting standards and procedures.

The *NOS/ENC Object Specifications* are not intended to replace the *IHO/S-57 Appendix B.1, ENC Product Specification, Annex A - Use of the Object Catalogue for ENC* as the official document from which ENC encoding guidelines are to be obtained, but is only being provided to facilitate the NOS transition from a paper/raster chart production environment to an IHO/S-57 vector ENC production environment.

The *IHO/S-57 Appendix B.1, ENC Product Specification, Annex A - Use of the Object Catalogue for ENC* remains the official and final authority for the encoding of all NOS ENC information and for the resolution of any discrepancies which may arise between the two aforementioned documents.

Navigational Aids
Section 5.30

Section 5.30 - Navigational Aids

Introduction

The purpose of the Navigational Aids Section of the *NOS/ENC Object Specifications* is to provide the following:

1. A thorough understanding of the terms "navigational aid" and "aid to navigation".

2. Guidelines for properly encoding all navigational aids in accordance with IHO/S-57 standards.

3. Guidelines for incorporating (into the encoding) all previously established but appropriate NOS charting standards and procedures .

4. An MCD document to serve as a resource and basis for ensuring uniformity in the transformation from a raster/paper charting environment to an Electronic Navigational Chart vector environment.

5. Appendices:

   a. to serve as convenient reference documents, and

   b. which include the following

   - **APPENDIX - I:** " NOS/ENC Object Glossary"

     Objective: To provide definitions and graphic examples (i.e., NOS and IHO) of all ENC objects classified as navigational aids.

   - **APPENDIX - II:** " NOS/ENC Feature-Object Translation Tables"

     Objective: To provide the names of the S-57 ENC object counterparts of NOS navigational aid nautical features.

   - **APPENDIX - III:** " A Few Pages from the U.S. Coast Guard Light List"

     Objective: To provide guidelines for interpreting ambiguous U.S. Coast Guard Light List information as the information applies to the IHO/S-57 encoding of aids to navigation.

Section 5.30 - NAVIGATIONAL AIDS

Table of Contents

NAVIGATIONAL AIDS

I. Definitions

Navigational Aid: The term **"navigational aid"** is a general term which covers any instrument, device, chart, method, etc., intended to assist in the navigation of a craft. This category encompasses all *"aids to navigation"*, and also includes ranges, course lines, traffic separation schemes, vessel traffic services, ferries, rescue stations and other marine navigation services.

Aid to Navigation: An **"aid to navigation"** is a man-made structure or device external to a craft, and specifically designed to assist navigators in determining their position or a safe course, or to warn of dangers or obstructions. When the information is transmitted by light waves, the device is a visual aid to navigation; if by sound waves, an audible aid to navigation; and if by radio waves, a radio aid to navigation. Any aid to navigation using electronic equipment, whether or not radio waves are involved, may be considered an electronic aid to navigation. Lights, fog signals, buoys, daybeacons, radiobeacons and LORAN-C lattices are the principal aids to navigation shown on MCD charts.

The term "aid to navigation" should not be confused with the more general term "navigational aid".

II. Nautical Chart *Feature* vs. ENC S-57 *Object Class*

For a complete listing of all NOS nautical chart features classified as navigational aids and their ENC/ S-57 object counterparts, refer to *APPENDIX II: NOS/ENC Feature-Object Translation Tables*.

III. Navigational Aids

1. Collection Criteria

All navigational aids indicated in documents originating from official sources (i.e., USCG, CFR, state or local governments, etc.) shall be collected and encoded for ENC purposes.

When navigational aids are to be collected and encoded from a MCD paper/raster chart, ensure the chart to be used as the source document represents the **largest scale coverage for the particular geographic region.**

2. Data Collection Guidelines

After identifying the document(s) to be used as the source of applying (or revising) a navigational aid to an ENC, the application (or revision) of all relevant data will occur in 2 phases. The first phase involves *the identification of the navigational aid's appropriate ENC object class and the subsequent portrayal of its geometry.* The second phase involves the *encoding of the associated attributes*. Attributes provide information which is relevant to an ENC object's navigational purpose.

A. Navigational Aid Source Documents

The documents and/or authorities which will normally serve as the primary sources for the application or revision of navigational aids are provided in the following table.

OFFICIAL SOURCE DOCUMENTS AND AUTHORITIES WHICH MAY BE USED IN THE APPLICATION OR REVISION OF NAVIGATIONAL AIDS		
Code of Federal Regulations (CFR), Title 33	Local Notice to Mariners (LNM)	NIMA Weekly Notices to Mariners (NM)
NOS Hydrographic Surveys	NOS Topographic Surveys	NOS Field Examinations
USACE Construction Permits and Surveys	New Aeronautical and Nautical Charting Investigations (NANCI)	Coast Pilot Inspection Reports
National Weather Service (NWS)	USCG Light Lists	USCG Correspondence and Port and Harbor Publications
USGS Quadrangles	State or Local Authorities	Local Pilots Associations
Lake Carriers Association	Canadian Nautical Charts	Canadian Hydrographic and Topographic Surveys
Canadian Notice to Mariners	Canadian Coast Guard List of Lights	Other Establishing Agencies
Other Authoritative International Source documents which are consistent with U.S. accuracy standards.		

Figure 5-ES108

Figure 5-ES108

3. Geometric Portrayal

For each navigational aid, see the respective sub-section of this chapter to:

- identify all S-57 object classes which shall be used in an aid's geometric portrayal, and,
- obtain the respective encoding procedures.

The *geometric primitives* allowed for ENC navigational aids are **point, line** and **area**. A geometric primitive indicates the allowed method of data collection and representation for an ENC object.

IV. Aids to Navigation

1. Collection Criteria

A. Previously Established and Charted Aids to Navigation.

All aids to navigation currently charted on NOS paper/raster charts are to be encoded and entered into the ENC database. This may involve performing historical document research to obtain all appropriate source document(s) which affect and provide the current status (i.e., characteristic information) and geographic position of a previously charted aid.

B. Continual Maintenance / Newly Established Aids to Navigation

During the continual maintenance phase of previously charted aids; or when new aids to navigation are established, all (aid to navigation) additions and revisions shall be applied to the ENC database by obtaining the appropriate CRIT database listing. The official source document may be obtained to encode aid attributes which are not available through the CRIT listing, but the official source document shall not be used to apply changes independently of the CRIT listing or the Update Service Branch (USB).

2. Data Collection Guidelines

A. Aid to Navigation Source Documents

The U.S. Coast Guard Local Notice to Mariners (LNM), the National Imagery and Mapping Agency Weekly Notice to Mariners (NM) and Form 76-40 letters included in NOS Field Party Descriptive Reports (DRs) are the primary and official source documents for establishing or revising the geographic position of all aids to navigation.

B. Aid to Navigation Characteristics

All characteristics of newly established aids will be obtained from the official LNM/NM, etc., which establishes the aid. The characteristics of an aid are used to properly encode its associated attributes. (Be sure to inspect the "Light List Corrections" section of each LNM to obtain additional characteristic information.)

To obtain the characteristics of previously charted aids to navigation, a reference to other official documents may be required. These other documents include the U.S. Coast Guard Light List and the U.S. Coast Guard Aids to Navigation Technical Manual.

The U.S. Coast Guard Light List contains descriptions of all lights and other marine aids to navigation maintained by or under the authority of the U.S. Coast Guard and which are located on waters used for general navigation. (Also see *APPENDIX I - "A Few Pages from the U.S. Coast Guard Light List".*)

The U.S. Coast Guard Aids to Navigation Technical Manual , "contains ...policies governing the selection, installation and maintenance of equipment for the ... Aids to Navigation Program." Although this publication is primarily issued for use by U.S. Coast Guard personnel, it contains information which is vital to the proper encoding of the ENC attribute *Signal group (SIGGRP)*.

C. Current and Historical Database Listings

Two (2) MCD database listings exist which have incorporated changes reported in the LNM/NM (and other official sources), and which will facilitate the encoding of all aids to navigation.

These database listings are the CRIT (Aids to Navigation CRITical Correction Listing) and the DIPFILE (Discrete Independent Point File).

The CRIT database began in 1987 incorporating aid changes reported in LNMs /NMs and continues today to serve as the official aids to navigation history of cartographic work.

The DIPFILE, established in1972 and maintained until 1986 was a database which contained the source and geographic positions of not only all aids to navigation as they existed on MCD charts in 1972 through 1986, it also contained the source and geographic position of other cartographic features such as landmarks, wrecks and obstructions.

To perform the encoding of all aids to navigation which are currently charted on a MCD chart, or which have been newly established by the U.S. Coast Guard, the resources provided in Figure 5-ES109 on the following page, shall be used, and, in accordance with the specified order.

Current and Historical Documents Used to Encode Aids to Navigation	
Database Listing	Purpose
(1) **CRIT** *	To encode newly established and previously charted aids to navigation.
(2) **DIPFILE** *	To encode previously charted aids to navigation.
(3) **LNM/NM, etc. identified through historical document research.**	To encode previously charted aids to navigation and to obtain attribute information not provided in the CRIT or DIPFILE listings..
(4) **Largest scale chart on which aid is currently charted**. **	To encode previously charted aids to navigation.
(5) **U.S. Coast Guard Light List**	To only obtain attribute information not provided in the CRITor DIPFILE listings; on on the largest scale chart.

* The terms "CRIT" and "DIPFILE" are **never** to be encoded as the official source of an aid to navigation. The actual LNM/NM/etc. which has been identified in the CRIT listing, the DIPFILE listing or through historical research shall be the document encoded in the ENC database as the official source. (NOTE: The LNM/NM shall also be used to obtain attribute information not provided in the CRITor DIPFILE listings.)

** When an aid to navigation is scaled from a MCD paper/raster chart, the nautical chart number shall be encoded as the official source of the aid. Always ensure the largest scale chart on which the aid is currently charted is used as the source of scaling.

The official source of an aid to navigation (and other navigational aids) is encoded in the ENC attribute *Source Indication (SORIND)*. The official source date is recorded in the ENC attribute *Source Date (SORDAT)*.

Figure 5-ES109

ENC Bulletin. RE:Official Source Documents and Aid to Navigation Characteristic Changes

When it is required (through a LNM/NM) to only revise the characteristics of an aid to navigation, the official source of the aid to navigation **shall not** be revised in the ENC database to reflect the source of the characteristic revision.

The official source shall always and only reflect the source of the official geographic position.

ENC Bulletin. RE: NAD83 Horizontal Datum Shift Values

For those aids to navigation whose official source date is:

(a.) prior to the (NOS) date of application of the NAD83 horizontal datum shift (i.e., prior to 1989), or

(b.) prior to the LNM/NM publishing geographic positions in NAD83,

the correct NAD83 shift values are to be applied to the official geographic position for ENC encoding purposes.

The NAD83 datum shift values for each MCD paper/raster chart may be identified by inspecting the respective chart Standard located in the Nautical Data Branch (NDB).

3. Geometric Portrayal

A. Aids to Navigation (i.e. Lights, Buoys and Daybeacons)

To emulate the real world, aids to navigation within the ENC environment will not only be encoded as the specified aid (i.e., light, buoy, daybeacon), all components of the aid will also be encoded. For example, in the real world if a navigator was approaching Annapolis Harbor, the navigator would not only see the light beam of Annapolis Harbor Channel Light 1AH, he would also see the daymark which identifies the light as 1AH and the structure which supports both the light and the daymark. Each of these three objects (i.e., the light, the daymark and the supporting structure) will, for ENC purposes, be encoded.

Aids to navigation, in actuality, are composed of fixed or floating *structures* carrying *equipment* objects. The most common structures are beacons, buoys and daymarks. The most common equipment objects are lights, topmarks, daymarks and fog signals.

In the Annapolis Harbor Channel Light 1AH example above, the structural component is a beacon (as identified from the light list), the equipment objects are the daymark and the light.

A.1 Structural Objects

Structural objects are objects which are permanently fixed to the earth's surface **or** which serve as a base on which equipment objects rest.

More detailed listings of ENC objects which may be encoded as a structural object of an aid to navigation are provided in Figure 5-ES111 on the following page.

A.2 Equipment Objects

Equipment objects are objects which have been added, attached or fastened to the structural object.

More detailed listings of ENC objects which may be encoded as aid to navigation equipment objects are provided Figure 5-ES112 on the following page.

A.3 Examples

Figure 5-ES110 below provides examples of very basic combinations of ENC objects which may comprise one (1) NOS aid to navigation nautical feature.

Several ENC objects may comprise one (1) NOS aid to navigation nautical feature. For example:		
Nautical Chart Feature	**ENC S-57 Object Classes**	**Structural/Equipment**
Light	1. beacon, lateral (BCNLAT) 2. daymark (DAYMAR) 3. lights (LIGHTS)	1. structural object 2. equipment object 3. equipment object
Light with fog signal	1. landmark (LNDMRK) 2. fog signal (FOGSIG) 3. lights (LIGHTS)	1. structural object 2. equipment object 3. equipment object
Buoy	1. buoy,lateral (BOYLAT)	1. structural object
Buoy with topmark	1. buoy, isolated danger (BOYISD) 2. topmark (TOPMAR)	1. structural object 2. equipment object

Figure 5-ES110

Structural ENC Objects (Aids to Navigation)

ENC Object	ACRONYM	ENC Object	ACRONYM
Beacon,cardinal	BCNCAR	Buoy, isolated danger	BOYISD
Beacon, isolated danger	BCNISD	Buoy, lateral	BOYLAT
Beacon, lateral	BCNLAT	Buoy, safe water	BOYSAW
Beacon, safe water	BCNSAW	Buoy, special purpose/general	BOYSPP
Beacon, special purpose/general	BCNSPP	Daymark	DAYMAR
Buoy, cardinal	BOYCAR	Light float	LITFLT
Buoy, installation	BOYINB	Light vessel	LITVES

Figure 5-ES111

Equipment ENC Objects (Aids to Navigation)

ENC Object	ACRONYM	ENC Object	ACRONYM
Daymark	DAYMAR	Radio station	RDOSTA
Fog signal	FOGSIG	Radar transponder beacon	RTPBCN
Lights	LIGHTS	Retro-relector	RETRFL
Radar station	RADSTA	Topmark	TOPMAR

Figure 5-ES112

A.4 Other ENC Aids to Navigation

For each aid to navigation, see the respective sub-section of this chapter to:

- identify all S-57 object classes which shall be used in an aid's geometric portrayal, and,
- obtain the respective encoding procedures.

The *geometric primitive* allowed for ENC aids to navigation is **point**. A geometric primitive indicates the allowed method of data collection and representation for an ENC object.

(The remainder of this page is intentionally blank.)

V. Relationships

When applicable, relationships must be formally established between ENC objects:

- to ensure the object(s) are topologically structured in accordance with IHO/S-57 standards,
- to ensure the proper information (and appropriate warnings) are passed on to the ECDIS user,

There are three (3) types of relationships between objects:

1. Master to slave
2. Aggregation (C_AGGR), and
3. Association (C_ASSO).

A. Master to Slave Relationship

When an aid to navigation is composed of a structure and equipment objects, a master to slave relationship must be established between them (i.e., the structure and equipment objects). Establishing this master/slave relationship enables an ENC, when used in ECDIS, to properly communicate to the mariner all applicable information required for daytime navigation, nighttime navigation or both.

An aid to navigation's structural object (see page 863) **must** always be encoded as the master; its equipment objects (see page 864) **must** each be encoded as a slave.

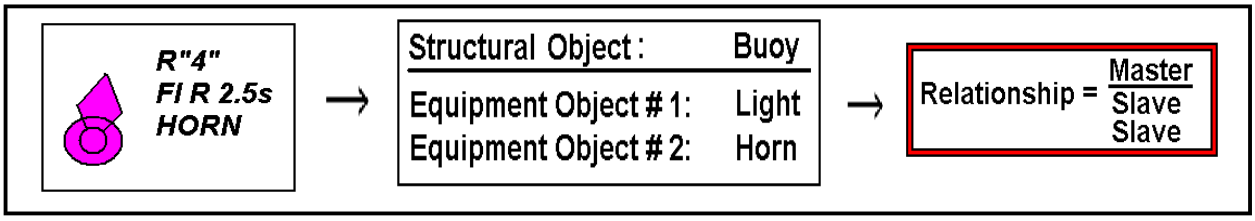

Figure 5-ES113

EXCEPTION: When the nature of the structure is unknown, or when there is no structural object provided in the source (or reference) document, one of the equipment objects shall be chosen as the master, giving priority to a light if one exists.

However, if a fixed light is located in a water area, and the structure which supports it is unknown, an ENC object Pile [PILPNT] shall be encoded at the same position as the light. This will ensure the (ECDIS) display of a symbol when the light object is turned off during daytime navigation. *(See also Nodes in Section 2.30.7-Topological Structure.)*

ENC Bulletin. RE: Master/Slave Relationships and Geographic Positions

All of an aid to navigation's structural and equipment objects **must** be encoded as having the same geographic position (i.e., they **must** share an *isolated node). [See Section 2.30.7 for more information on Nodes.]*

ENC Bulletin. RE: Object Name (OBJNAM)

The name of the aid to navigation shall be encoded in the *Object Name (OBJNAM)* attribute for the master object only. It shall **not** be repeated in the *Object Name (OBJNAM)* attribute for each slave object.

B. Aggregation

The * *collection object* aggregation (C_AGGR) is used to encode a **"link"** between objects that are functionally related (e.g., range lights on a range line; all elements of a traffic separation scheme - traffic lanes, separation zones, precautionary areas, roundabouts, etc.; and, the markers and course lines of measured distances.)

* A *collection object* is the classification of ENC object which encodes the relationship between other objects.

C. Association

The collection object association (C_ASSO) is used to encode an **association** between two or more objects (e.g., a wreck and the buoy which marks it).

When an aid is to be deleted from the ENC database, the C_ASSO must be removed before the aid's structural and equipment objects are deleted.

VI. Encoding

IHO/S-57 encoding involves:

- identifying the proper ENC object class(es) for a navigational aid nautical feature,
- assigning to this object(s) the appropriate attributes and attribute values (as provided in the IHO/S-57 Object Catalogue) and,
- creating (when applicable) all ENC collection objects (i.e., Aggregation and/or Association).

1. *IHO*/S-57 *Object Catalogue*

The *IHO*/S-57 *Object Catalogue* is the official document containing the listing of all object classes, attributes, and attribute values. It provides the following definitions:

> Object Class: *a generic description of features which can be categorized into a finite number of feature types* [e.g., DEPTH CONTOUR, DEPTH AREA, LIGHT, WRECK, DREDGED AREA, OBSTRUCTION].

Features falling into one of these categories (i.e. DEPTH CONTOUR, DEPTH AREA, LIGHT, WRECK, DREDGED AREA, or OBSTRUCTION) will be more *precisely* identified by assigning the appropriate *attributes* of the respective object class.

> Attribute: *a category of characteristics about an object*.

For each instance of an object, there exists a list of allowable attributes. All allowable attributes are provided in the form of a six character acronym (e.g. VALDCO); and may only be used **once** for the particular object (i.e. a depth contour will never have two or more VALDCO attributes). However, to be assigned to each attribute will be *attribute values*, of which, in certain circumstances, a multiple selection is permitted.

> Attribute Value: *the unique and distinctive characteristic(s) of an object*

The ***IHO*/S-57 *Object Catalogue*** also provides the following information:

Attribute values (or "the expected input") may be of six (6) types:
1. enumerated
2. list
3. integer
4. coded string
5. free text
6. float

Enumerated - The expected input is a number selected from a list of predefined attribute values. Exactly one value must be chosen.

List - The expected input is a list of one or more numbers selected from a list of predefined attribute values. Where more than one value is used, they must normally be separated by commas but in special cases slashes ("/ ") may be used.

Integer - The expected input is an integer with defined range, units and format.

Coded String - The expected input is a string of ASCII characters in a predefined format.

Free Text - The expected input is a free-format alphanumeric string. It may be a file name which points to a text or graphic file.

Float - The expected input is a floating point numeric value with defined range, resolution, units and format.

2. Encoding Examples

The following examples illustrate the encoding of an aid to navigation and other navigational aids.

(The remainder of this page is intentionally blank.)

EXAMPLE ONE: ENCODING AN AID TO NAVIGATION

The red and green junction gong buoy in ***Figure 5-ES114*** below would be encoded as follows: *[NOTE: Depending on the type of information provided in the source document, other attributes (which are not listed below) may also be populated to fully encode the aid.]*

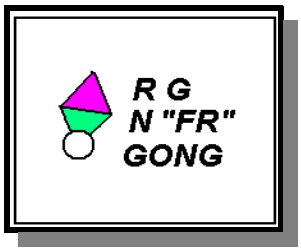

Figure 5-ES114

Master: **ENC S-57 Object Class:** Buoy, lateral [BOYLAT]			
Attribute	**Attribute Acronym**	**Attribute Value**	
Buoy shape	BOYSHP	1: Nun (conical)	
Category of lateral mark	CATLAM	4: preferred channel to port lateral mark	
Colour	COLOUR	3: red	4: green
Colour pattern	COLPAT	1: horizontal stripes	
Object name	OBJNAM	Flip Rock Gong Buoy FR	

Figure 5-ES115

(continued)

EXAMPLE ONE:
(continued)
ENCODING AN AID TO NAVIGATION

The *gong* of the buoy in itself would also be encoded as an ENC object, (i.e., Fog signal):

Slave: **ENC S-57 Object Class:** Fog signal [FOGSIG]		
Attribute	**Attribute Acronym**	**Attribute Value**
Category of fog signal	CATFOG	9: gong

Figure 5-ES116

Comments:

- A *master/slave* relationship will be encoded between the buoy and the gong. The buoy (i.e., **buoy, lateral**) is considered the structure of the aid and would be encoded as the *master* object; the gong (i.e., **fog signal**) is considered an equipment object of the aid and would be encoded as a *slave*.

- The (attribute) *Object name* [i.e.,Flip Rock Gong Buoy FR) will only be encoded in the master object and will not be encoded in the slave.

- If the purpose of the buoy (or other navigational aid) is to mark a rock (wreck, regulated area, etc.), the rock (wreck, regulated area, etc.) would in itself be properly encoded. The collection object **Association (C_ASSO)** would subsequently be created to encode an associated relationship between the buoy and the rock.

EXAMPLE TWO: ENCODING A NAVIGATIONAL AID

A. Coastguard station

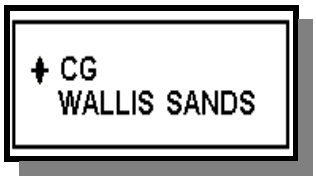

Figure 5-ES117

ENC S-57 Object Class: Coastguard station [CGUSTA]

Attribute	Attribute Acronym	Attribute Value
Object name	OBJNAM	Wallis Sands
Status	STATUS	1: permanent

B. Signal station, traffic

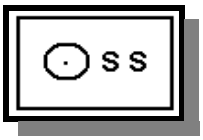

Figure 5-ES118

ENC S-57 Object Class: Signal station, traffic [SISTAT]

Attribute	Attribute Acronym	Attribute Value
Category of signal station, traffic	CATSIT	1: port control
STATUS	STATUS	1: permanent

C. Ferry route

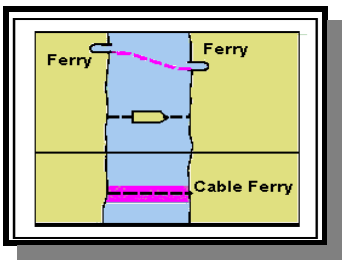

Figure 5-ES119

ENC S-57 Object Class: Ferry route [FERYRT]

Attribute	Attribute Acronym	Attribute Value
Category of ferry	CATFRY	2: cable ferry
STATUS	STATUS	1: permanent

EXAMPLE TWO:
(continued)
ENCODING A NAVIGATIONAL AID

D. Pilot Operating Area

ENC S-57 Object Class: Pilot boarding place [PILBOP]

Attribute	Attribute Acronym	Attribute Value
Category of pilot boarding place	CATPIL	3. pilot comes out from shore
Pilot district	PILDST	San Diego
Status	STATUS	1: permanent

Figure 5-ES120

E. Traffic Separation Scheme Roundabout

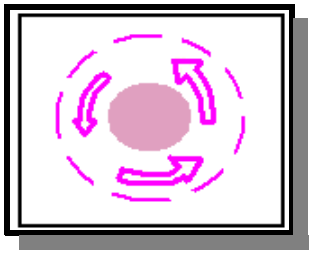

Figure 5-ES121

ENC S-57 Object Class: Traffic separation scheme roundabout [TSSRON]

Attribute	Attribute Acronym	Attribute Value
Category of traffic separation scheme	CATTSS	1: IMO - adopted
Restriction	RESTRN	1: anchoring prohibited
Status	STATUS	1: permanent

VII. OBJECT ENCODING GUIDELINES
(Navigational Aids)

Index of Objects (Navigational Aids)

The Index of Objects on pages 5-Intro_24 through 5-Intro_30 lists the ENC navigational aid objects whose encoding procedures are provided in Section 5.30 of the *NOS/ENC Object Specifications*

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INDEX OF OBJECTS (NAVIGATIONAL AIDS)

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Object — **Section Number**

L (continued)

M

N

O

None . . . . . .

INDEX OF OBJECTS (NAVIGATIONAL AIDS)

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Object | **Section Number**

T (continued)

U-Z

None . . . . . .

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 004/02

APRIL 16, 2002

File With Nautical Chart Manual Volume 1, Part 2, Section 5.30

TO: All Cartographers
Marine Chart Division

SUBJECT: Nautical Chart Manual NOS/ENC Object Specifications: Navigational Aids-
Reference Section and Object Glossary

APPLICATION: All Nautical Charts

Effective immediately, the following attachment adds to the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition, Section 5.30.RF - NOS/ENC Object Specifications - Navigational Aids-Reference Section.

The attachment includes pages 5-RF_1 and 5-RF_2 containing introductory information and pages RF_3 through 5-RF_18 containing the NOS/ENC (Navigational Aids) Object Glossary.

Pages 5-RF_1 through 5-RF_18 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after NOS/ENC Object Specifications page 5-Intro_30.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

VII. REFERENCE SECTION

VII. REFERENCE SECTION

Section 5.30 - APPENDICES

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APPENDIX - I

NOS/ENC OBJECT GLOSSARY
(Navigational Aids)

APPENDIX - II

NOS/ENC OBJECT GLOSSARY
(Navigational Aids)

Objective:

To provide definitions and graphic examples of all ENC objects which are classified as navigational aids. Definitions and graphics are extracted or adapted from the following sources:

a. UKHO NP 735, 5th Edition
b. IHO Dictionary, S-32, 5th Edition
c. DG IWG Oct. 1987
d. IHO Chart Specifications, M-4
e. IHO S-57 Object Catalogue
f. International Maritime Dictionary, 2nd Edition
g. International Telecommunication Union (ITU)
h. Ships Routing, 4th Edition, Amendment No. 2, 1980, IMO
i. IMO Routing, 6th Edition
j. *IHO S-57 Use of the Object Catalogue for ENC*, Version 2.0
k. Nautical Chart Manual, Seventh (1992) Edition
l. Chart No. 1, United States of America, Nautical Chart, Symbols Abreviations and Terms

Notes:

1. Also included in the glossary are the definitions (and graphic examples) of several objects which are not typically classified as navigational aids. These objects, however, may serve as navigational aids support structures and therefore are being included to ensure their encoding in the proper context.

2. The ENC symbology provided in this reference document is based on its representation in the Dkart™ ENC viewer. Should another ENC viewer, at some time in the future, become the dominant product to be used by MCD personnel, all affected symbology within this document will be revised accordingly.

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NOS/ENC OBJECT GLOSSARY
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A

❑ NONE

B

❑ **Beacon, cardinal**

A fixed navigation mark used in conjunction with the compass to indicate where the mariner may find the best navigable water. It is placed in one of the four quadrants (North, East, South and West); bounded by inter-cardinal bearings from the point marked.

NOTE: Cardinal aids are not used in U.S. waters. However, for those NOS charts containing overlapping Canadian coverage, some cardinal aids may be charted.

❑ **Beacon, isolated danger**

A fixed navigation mark erected on an isolated danger (a.) of limited extent and, (b.) having navigable water all around it.

NOTE: The USCG currently has no isolated danger beacons installed.

Graphic Examples:

NOS	(The color scheme of an isolated danger beacon is black and red; the charted shape of the beacon is dependent on the shape of the beacon installed by the USCG and the appropriate NOS charting guidelines.)
ENC	(with shape of daymark attached)

❑ **Beacon, lateral**

A fixed navigation mark used to indicate the port (left) or starboard (right) hand side of the route to be followed.

Graphic Examples:

NOS	G "1"	R "2"
	GR "U"	RG "G"
ENC	(with shape of daymark attached)	

❑ **Beacon, safe water**

A fixed navigational mark used to indicate the existence around its geographic position, of navigable water.

Graphic Examples:

NOS	**ENC**
RW "A"	(with shape of daymark attached)

❑ **Beacon, special purpose**

A fixed navigational mark primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Coast Pilot or Notices to Mariners. (UKHO NP 735, 5th Edition)

Graphic Examples:

NOS	**ENC**
Y "A"	(with shape of daymark attached)

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❑ Buoy, cardinal

A floating navigation mark used in conjunction with the compass to indicate where the mariner may find the best navigable water. It is placed in one of the four quadrants (North, East, South and West); bounded by inter-cardinal bearings from the point marked.

NOTE: Cardinal aids are not used in U.S. waters. However, for those NOS charts containing overlapping Canadian coverage, some cardinal aids may be charted.

❑ Buoy, installation

A buoy used for loading tankers with gas or oil.

Graphic Examples:

NOS	ENC
	

❑ Buoy, isolated danger

A buoy moored on or above an isolated danger of limited extent, and having navigable water all around it.

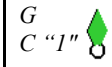
Graphic Examples:

NOS	ENC
	

❑ Buoy, lateral

A buoy used to indicate the port (left) or starboard (right) hand side of the route to be followed.

Graphic Examples:

NOS	**(a.)** *G C "1"* 	**(b.)** *R N "2"*
	(c.) *GR C "S"*	**(d.)** *RG N "G"*
ENC	**(a.)** 	**(b.)** 
	(c.) 	**(d.)** 

❑ Buoy, safe water

A buoy used to indicate the existence of navigable water around its position.

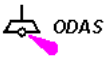
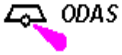
Graphic Examples:

NOS	**(a.)** *RW "N" Mo(A)* 	**(b.)** *RW SP "B"* 	
	(c.) *RW"N"* 		
ENC	**(a.)** 	**(b.)** 	**(c.)** 

❑ Buoy, special purpose/ general

A buoy primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Coast Pilot or Notices to Mariners. (UKHO NP 735, 5th Ed.)

Graphic Examples:

NOS	**(a.)** *Y C "A"* 	**(b.)** *Y N "C"*
	(c.) 	**(d.)** ODAS 
ENC	**(a.)** 	**(b.)** 
	(c.) 	**(d.)** ODAS 

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C

❑ **Coastguard station**

Coastal or port facilities which provide emergency services for the marine public. These services may include medical assistance, search and rescue capability, law enforcement, and fire control.

Graphic Examples:

NOS	ENC
CG R TR C G WALLIS SANDS	CG CG CG

D

❑ **Daymark**

The identifying characteristics of an aid to navigation. A daymark which serves to facilitate an aid to navigation's recognition against a daylight viewing background.

Graphic Examples:

NOS	**(a.)** G "1"	**(b.)** R "2"
	(c.) GR "U"	**(d.)** RG "G"
ENC	**(a.)**	**(b.)**
	(c.)	**(d.)**

❑ **Distance Mark**

Indicates the distance measured from an origin. May either be a solid visible structure or a distinct location having or requiring no special installation. Usually found on canals and on the Mississippi River.

Graphic Examples:

NOS	*Not specified*
ENC	km 32 km 36

E

❑ NONE

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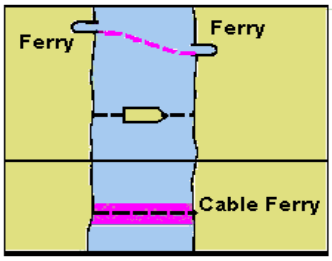
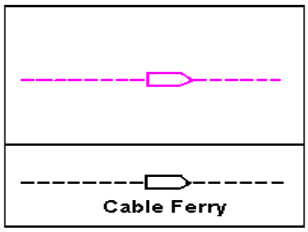
F

❑ **Ferry Route**

A route in a body of water where a ferry crosses from one shoreline to another.

Graphic Examples:

NOS	
ENC	

❑ **Fog Signal**

A warning signal transmitted by a vessel or aid to navigation during periods of low visibility. It may also be the device producing such a signal.

Graphic Examples:

NOS	ENC
BELL	
GONG	
HORN	
WHIS	

G-K

❑ NONE

L

❑ **Landmark**

A prominent object having a fixed geographic position and which can be used to determine a mariner's location or direction.

Graphic Examples:

NOS	See Chart No. 1, Section E
ENC	See IHO S-52, Section IE

❑ **Light Float**

Light-floats are usually unmanned lightships and are used instead of smaller lighted buoys in waters where strong currents are experienced or when a greater elevation than that of a lighted buoy is necessary.

Graphic Examples:

NOS	ENC
(IALA) 	(IALA) (NON-IALA) 
(NON-IALA) *Not specified*	

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M

❑ **Lights**

A luminous or lighted aid to navigation.

Graphic Examples:

NOS	See Chart No. 1, Section P
ENC	See IHO S-52, Section IP

❑ **Mooring/Warping Facility**

The equipment or structure used to secure a vessel.

Examples:

Bollard
Cable
Chain
Dolphin
Mooring buoy
Pile
Post
Wire

N

❑ **Navigation Line**

A straight line extending towards an area of navigational interest and typically generated by two navigational aids or one navigational aid and a bearing.

Examples:

Range Lines
Measured distance lines
Transit line
Clearing line

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NOS/ENC OBJECT GLOSSARY
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O

❑ **Offshore Platform**

A permanent offshore structure, either fixed or floating, used in the production of oil or natural gas.

Graphic Examples:

NOS	ENC
■	⊡

P

❑ **Pile**

A long heavy timber or section of steel, wood, concrete, etc. forced into the earth. It may serve as a support mechanism (e.g., for a pier) , or it may serve as a free standing pole within a marine environment.

Graphic Examples:

NOS	○ Pile ● Pile (Great Lakes)	○ Post ● Post (Great Lakes)
ENC	•	●

❑ **Pilot Boarding Place**

Meeting or boarding places where vessels pick up or disembark pilots.

Graphic Examples:

NOS	ENC
Pilots	
PILOT OPERATING AREA	

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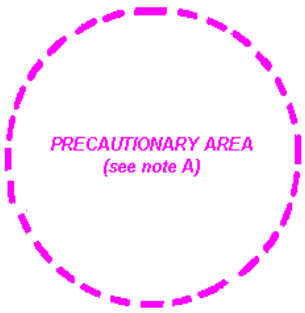
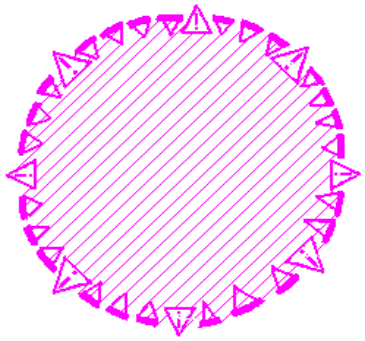
Q

❑ **Precautionary Area**

A routing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended.

Graphic Examples:

NOS	ENC
	

❑ NONE

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R

❑ Radar Line
A track along which ships may be guided by coastal radar stations in the event of bad visibility. It is also known as a radar guided track.

Graphic Examples:

NOS	*Not specified*
ENC	Ra

❑ Radar Range
Indicates the coverage of a sea area by a radar surveillance station. Inside this area a vessel may request shore-based radar assistance, particularly in poor visibility.

Graphic Examples:

NOS	*Not specified*
ENC	Ra Cuxhaven

❑ Radar Reflector
A special fixture fitted to or incorporated into the design of certain aids to navigation to enhance their ability to reflect energy. In general, these fixtures will materially improve the use of these particular aids by vessels equipped with radar.

Graphic Examples:

NOS	**ENC**

NOTE: Radar reflectors on buoys are generally not charted on NOS paper/raster charts.

❑ Radar Station
A station with a transmitter emitting pulses of ultra-high frequency radio waves. These radio waves are reflected by solid objects and are detected upon their return to the sending station.

Graphic Examples:

	Radar Surveillance Station	Coast Radar Station
NOS	Ra	Ra
ENC	Radar Surveillance Station	Ra

❑ Radar Transponder Beacon
A receiver-transmitter device which, when triggered by a surface search radar, automatically returns a distinctive signal which can appear on the display of the triggering radar, providing range, bearing and identification information.

Graphic Examples:

NOS	RACON
ENC	

❑ Radio Calling-in Point
Also called radio reporting points, these have been established in certain busy waterways and port approaches to assist traffic control. On passing these points or crossing a defined line, vessels are required to report on VHF to a Traffic Control Center.

Graphic Examples:

NOS	**ENC**
	7 B

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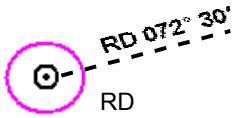
❑ **Radio station**

A place equipped to transmit radio waves. Such a station may be either stationary or mobile, and may also be provided with a radio receiver. (IHO Dictionary, S-32, 5th Ed., 4191)

Graphic Examples:

	NOS	ENC
Circular (non-directional) marine or aero-marine Rbn	 R Bn, RC	
Directional Radiobeacon	 RD	
Rotating pattern Radiobeacon	 RW	
Consol beacon	 CONSOL Bn 180 kHz MMF	
Radio direction-finding station	 RDF	
Coast radio station providing QTG service	 R Sta	
Aeronautical Radiobeacon	 AERO R Bn	

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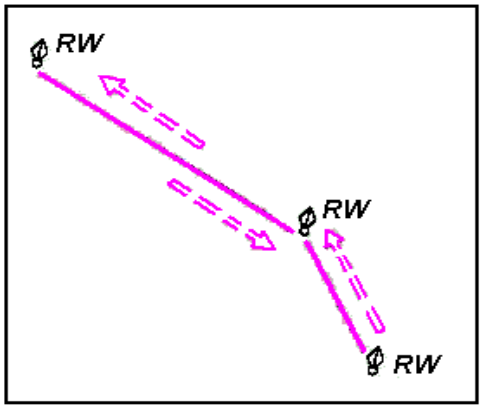
❑ **Recommended Route Centerline**

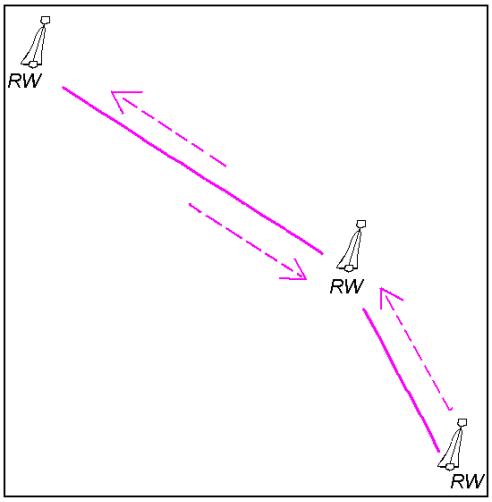
A recommended route centerline indicates the centerline of a recommended track and is often marked by centerline buoys [See Recommended Track on the following page.]

Graphic Examples:

NOS



ENC

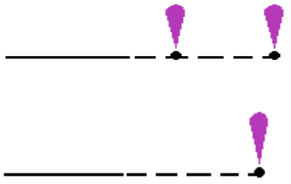
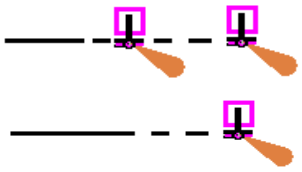


APPENDIX - I
NOS/ENC OBJECT GLOSSARY
(Navigational Aids)

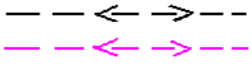
❑ **Recommended Track**

A route which has been specially examined to ensure (as far as possible) it's freedom of dangers. It is a route along which ships are advised to navigate.

Graphic Examples:

Example 1: Recommended Track on a Leading Line (i.e., the solid portions of the following lines)	
NOS	
ENC	

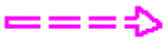
Example 2: Recommended Track Based on a System of Fixed Marks	
NOS	
ENC	

Example 3: Recommended Track Not Based on a System of Fixed Marks	
NOS	
ENC	

❑ **Recommended Traffic Lane Part**

Indicates the recommended traffic flow. An optional part of an IMO adopted routing measure. Several Hydrographic Offices, in consultation with their Ministries of Transport, have added recommended directions in areas such as the outer approaches to major ports in order to show the best routes for crossing traffic or to minimize head-on encounters.

Graphic Example:

NOS and **ENC**


❑ **Rescue Station**

A location at which lifesaving equipment is located, especially lifeboats.

Graphic Example:

NOS and **ENC**


❑ **Retro-reflector**

A means of distinguishing unlighted marks at night. A retro-reflector is a mark which has retro-reflective material secured to it in a particular pattern for the purpose of reflecting back light.

Graphic Examples:

NOS and **ENC**
Symbology not specified

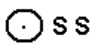
APPENDIX - I
NOS/ENC OBJECT GLOSSARY
(Navigational Aids)

S

❑ Signal Station, Traffic

A place on shore from which signals are made to ships at sea to regulate the movement of traffic.

Graphic Examples:

NOS	ENC
	

❑ Signal Station, Warning

A place on shore from which signals are made to ships at sea to warn of various dangerous conditions.

Graphic Examples:

NOS	See Chart No. 1, Section T
ENC	

❑ Submarine Transit Lane

An area where submarines may navigate under water or at the surface.

Graphic Examples:

NOS	*Symbology not specified*
ENC	

T

❑ Topmark

One or more objects of characteristic shape and color; placed on top of a beacon or buoy to aid in its identification.

Graphic Examples:

NOS	See Chart No. 1, Section Q
ENC	See INT 1 - Section IQ

❑ Traffic Separation Line

A line which separates (a.) traffic lanes containing ships traveling in opposite or nearly opposite directions; and/or (b) traffic lanes designated for particular classes of ships proceeding in the same direction.

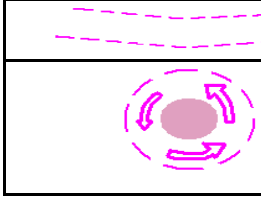
Graphic Examples:

NOS and ENC


❑ Traffic Separation Scheme Boundary

The component of a Traffic Separation Scheme which shall be used to encode the outer limits of traffic lanes or traffic separation scheme roundabouts.

Graphic Examples:

NOS and ENC


❑ Traffic Separation Scheme Crossing

A defined area where at least four traffic separation scheme lanes cross.

Graphic Examples:

NOS	See Chart No. 1, Section/item: M/23
ENC	See INT 1, Section/item: IM/23

❑ Traffic Separation Scheme Lane Part

An area of a Traffic Separation Scheme in which the direction of the flow of traffic is uniform.

Graphic Examples:

NOS and ENC


APPENDIX - I
NOS/ENC OBJECT GLOSSARY
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❑ **Traffic Separation Scheme Roundabout**

A traffic separation scheme in which traffic moves in a counter-clockwise direction around a specified point or zone. (IHO Dictionary, S-32, 5th Ed., 4448)

Graphic Examples:

NOS and ENC


❑ **Traffic Separation Zone**

A zone which separates (a.) traffic lanes containing ships traveling in opposite or nearly opposite directions; or (b) traffic lanes designated for particular classes of ships proceeding in the same direction. (Adapted from IMO Routeing, 6th Ed.)

Graphic Examples:

NOS and ENC


End of ENC Navigational Aids Glossary

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 005/02

APRIL 17, 2002

File With Nautical Chart Manual Volume 1, Part 2, Section 5.30

TO: All Cartographers
Marine Chart Division

SUBJECT: Nautical Chart Manual NOS/ENC Object Specifications (Navigational Aids) Translation Tables

APPLICATION: All Nautical Charts

Effective immediately, the following attachment adds to the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition, pages 5-RF_19 through 5-RF_36.

The attachment contains the NOS/ENC Object Specifications (Navigational Aids) Translation Tables and is to serve as a mechanism for identifying synonymous NOS navigational aid features and IHO S57 objects.

Pages 5-RF_19 through 5-RF_36 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after NOS/ENC Object Specifications page 5-RF_18.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

APPENDIX - II

NOS/ENC FEATURE-OBJECT TRANSLATION TABLES
(Navigational Aids)

APPENDIX - II

NOS/ENC FEATURE-OBJECT TRANSLATION TABLES
(Navigational Aids)

Objectives:

1. To provide a mechanism for determining the IHO S-57 *object* / NOS navigational aid *feature* counterparts.

2. To ensure uniformity with respect to the ENC encoding and conversion of all applicable navigational aids.

Contents:

The NOS/ENC Feature-Object Translation Tables are composed of two (2) parts. Part 1 translates a nautical chart aid *feature* into its corresponding IHO/S-57 ENC *object*. Part 1 is to be used to identify the IHO/S57 object counterpart of the specified NOS nautical feature.

Part 2 is to be used when the IHO/S57 object name is first specified, and the name of the synonymous NOS nautical chart aid *feature* is desired.

Description of Column Headings:

"Nautical Chart Feature": The name of a navigational aid as it is currently entitled in Chart No. 1 or as it is commonly referred to within MCD.

"ENC S-57 Object": The name of a navigational aid as it is referred to in the IHO/S-57.

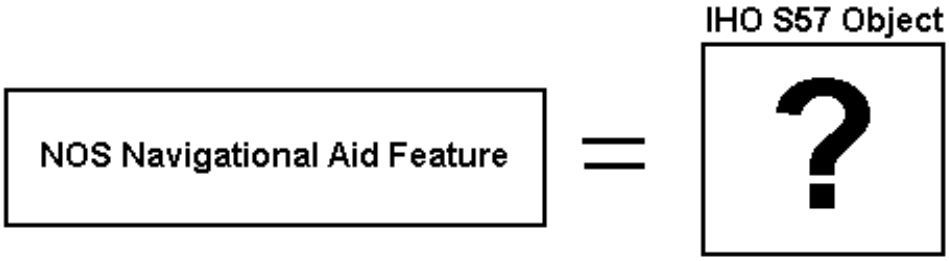
"ACRONYM": The six (6) letter abbreviation assigned by the IHO and which corresponds to the official IHO/S-57 ENC object class.

"Chart No. 1": The Chart No.1 section in which NOS and IHO graphic portrayals of the listed feature/object exist.

APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object



APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object

A

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Alternate Course: Marked by aids	Recommended track	RECTRC
• Alternate Course: Not marked by aids	Recommended track	RECTRC

B

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• SEE CHART NO. 1-SECTION Q-130.3	Beacon, cardinal	BCNCAR
	Buoy, cardinal	BOYCAR
• Buoys: Black/red/horiz.stripe/topmark	Buoy, isolated danger	BOYISD
• Buoys: Can (cylindrical) buoy	*See asterisk below*	
• Buoys: ELB superbuoy	Buoy, spec. purp./ gen.	BOYSPP
• Buoys: Fairway buoy	Buoy, safe water	BOYSAW
• Buoys: Isolated danger buoy	Buoy, isolated danger	BOYISD
• Buoys: Junction (pref. chan.) buoy	Buoy, lateral	BOYLAT
• Buoys: LNB/LANBY superbuoy	Buoy, spec. purp./ gen.	BOYSPP
• Buoys: Mid-channel buoy	Buoy, safe water	BOYSAW
• Buoys: mooring buoys	Mooring/Warping facility	MORFAC
• Buoys: Nun (conical) buoy	*See asterisk below*	
• Buoys: ODAS superbuoy	Buoy, spec. purp./ gen.	BOYSPP
• Buoys: Oil or gas installation buoy	Buoy, installation	BOYINB
• Buoys: Red/white/ vertical stripe	Buoy, safe water	BOYSAW
• Buoys: Safe water buoy	Buoy, safe water	BOYSAW
• Buoys: Special purpose buoy	Buoy, spec. purp./ gen.	BOYSPP
• Buoys: Superbuoy	Buoy, spec. purp./ gen.	BOYSPP

* A buoy_isolated danger (BOYISD); a buoy_lateral (BOYLAT); a buoy_safe water (BOYSAW) and a buoy_special purpose/general (BOYSPP) may be in the shape of a can or a nun. Examine the source document to determine the correct shape and ENC S-57 buoy object to be encoded.

APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object

C

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• the junction **Cable** of a mooring trot	Mooring/Warping facility	MORFAC
• Calling-in Points	Radio calling-in point	RDOCAL
• Channel range line: entire line (dashed and	Navigation line	NAVLNE
• Channel range line: navigable portion (solid)	Recommended track	RECTRC
• Clearing Line	Navigation line	NAVLNE
• Coast radar station	Radar station	RADSTA
• Coastguard station	Coastguard station	CGUSTA

D

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Dayboard	Daymark	DAYMAR
• Dolphin	Mooring/Warping facility	MORFAC

E

NONE

F

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Fairway anchorage	Anchorage area	ACHARE
• Ferries: Cable Ferry	Ferry Route	FERYRT
• Ferries: Ferry	Ferry Route	FERYRT
• Ferries: Ferry route	Ferry route	FERYRT
• Ferries: Ferry Slip	Shoreline Construction	SLCONS
• Ferries: Ferry Terminal	Shoreline Construction	SLCONS
• Fog signal	Fog signal	FOGSIG

G - H

NONE

APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object

I

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Isolated danger beacon	Beacon, isolated danger	BCNISD
• Isolated danger buoy	Buoy, isolated danger	BOYISD

J-K

NONE

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Junction cable of a mooring trot	Mooring/Warping facility	MORFAC

L

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Lifeboat station	Rescue station	RSCSTA
• Light	Lights	LIGHTS
• Light float	Light float	LITFLT

M

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Marker	Beacon, spec. purp./gen.	BCNSPP
• Measured distances: lines	Navigation Line (s)	NAVLNE
• Measured distances: markers	Beacons, special purp./gen.	BCNSPP

N

NONE

APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object

O

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Offshore platform	Offshore platform	OFSPLF
• One-way track	Recommended track	RECTRC

P

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Pilot boarding areas (limits)	Pilot boarding place	PILBOP
• Pilot boarding areas (symbol)	Pilot boarding place	PILBOP
• Precautionary Area	Precautionary area	PRCARE

Q

NONE

R

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Racon	Radar transponder bcn.	RTPBCN
• Radar range	Radar range	RADRNG
• Radar reference line	Radar line	RADLNE
• Radar reflector	Radar reflector	RADRFL
• Radar surveillance station	Radar station	RADSTA
• Radiobeacon	Radio station	RDOSTA
• Ramark	Radar transponder bcn	RTPBCN
• Range line: entire line (dashed and solid portions)	Navigation line	NAVLNE
• Range line: solid portion	Recommended track	RECTRC
• Recommended Course: marked by aids	Recommended track	RECTRC
• Recommended Course: not marked by aids	Recommended track	RECTRC
• Recommended direction of traffic flow	Recomm. traffic lane part	RCTLPT
• Recommended route (often marked by c/l buoys)	Recommended route C/L	RCRTCL
• Refuge beacon	Rescue station	RSCSTA
• Rescue station	Rescue station	RSCSTA
• Retro-reflector	Retro-reflector	RETRFL

APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object

S

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
Safety fairway (Not specified in Chart No. 1)	Fairway	FAIRWY
Signal Station: Auto. recording tide gauge	Signal station, warning	SISTAW
Signal Station: Bridge lights incl. Traffic signals	Signal station, traffic	SISTAT
Signal Station: Bridge passage signal station	Signal station, traffic	SISTAT
Signal Station: Danger signal station	Signal station, warning	SISTAW
Signal Station: Distress signal station	Signal station, warning	SISTAW
Signal Station: Firing practice signal station	Signal station, warning	SISTAW
Signal Station: General	Signal station, warning	SISTAW
Signal Station: Ice signal station	Signal station, warning	SISTAW
Signal Station: Lock signal station	Signal station, traffic	SISTAT
Signal Station: NWS signal station	Signal station, warning	SISTAW
Signal Station: Port control signal station	Signal station, traffic	SISTAT
Signal Station: Port entry and departure signal	Signal station, traffic	SISTAT
Signal Station: shows Intern. port traffic signals	Signal station, traffic	SISTAT
Signal Station: Storm signal station	Signal station, warning	SISTAW
Signal Station: Telegraph station	Signal station, traffic	SISTAT
Signal Station: Telegraph station	Signal station, warning	SISTAW
Signal Station: Tidal signal station	Signal station, warning	SISTAW
Signal Station: Tidal stream signal	Signal station, warning	SISTAW
Signal Station: Tide scale or gauge	Signal station, warning	SISTAW
Signal Station: Time signal station	Signal station, warning	SISTAW
Signal Station: Traffic signal station	Signal station, traffic	SISTAT
Signal Station: Wind station	Signal station, warning	SISTAW
Structure for: black and white daybeacon	*See asterisk below*	
Structure for: directional light	Beacon, spec purp/gen	BCNSPP
Structure for: green and white daybeacon	*See asterisk below*	

* Examine the source document to determine the correct shape and ENC S-57 beacon object to be encoded.

(“S” objects are continued on the following page.)

APPENDIX - II

TRANSLATION TABLES - PART 1

NOS Navigational Aid Feature *to* IHO S57 Object

S (continued)

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Structure for: green light/green square daybeacon	Beacon, lateral	BCNLAT
• Structure for: range lights	Beacon, spec purp/gen	BCNSPP
• Structure for: red and white octagonal daybeacon	Beacon, safe water	BCNSAW
• Structure for: red light/red triangular daybeacon	Beacon, lateral	BCNLAT
• Structure for: white and orange daybeacon	Beacon, spec purp/gen	BCNSPP
• Structure for: sector lights	*See double asterisk below*	
• Structure for: yellow lights	Beacon, spec purp/gen	BCNSPP
• Submarine transit line and exercise area	Submarine transit lane	SUBTLN

** The structure for a sector light may be a beacon_lateral (BCNLAT), a beacon_isolated danger (BCNISD), a beacon, safe water (BCNSAW) or a beacon_cardinal (BCNCAR). Examine the source document to determine the correct shape and ENC S-57 beacon object to be encoded.

T

NOS Navigational Aid Feature	IHO S-57 Object	IHO ACRONYM
• Topmark	Topmark	TOPMAR
• Transit Line	Navigation line	NAVLNE
• TSS: Crossing	TSS: TSS crossing	TSSCRS
• TSS: Established (mandatory) direction of traffic flow	TSS: TSS lane part	TSSLPT
• TSS: Roundabouts	TSS: TSS roundabout	TSSRON
• TSS: Separation zone	TSS: Traffic separation zone	TSEZNE
• TSS: Traffic lanes	TSS: TSS boundary	TSSBND
• TSS: Traffic separation line	TSS: Traffic separation line	TSELNE

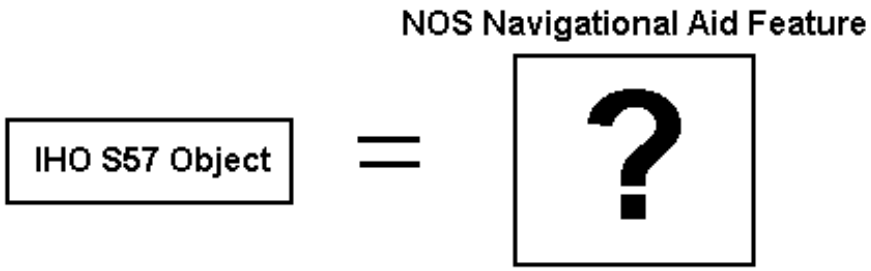
U-Z

NONE

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature



APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

A

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Anchorage area	ACHARE	Fairway anchorage

B

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Beacon, cardinal	BCNCAR	SEE CHART NO. 1-SECTION Q-130.3
• Beacon, isolated danger	BCNISD	Structure for: black and red daybeacon
• Beacon, lateral	BCNLAT	Structure for: green light
		Structure for: green square daybeacon
		Structure for: green and red square daybeacon
		Structure for: red light
		Structure for: red triangular daybeacon
		Structure for: red and green triangular daybeacon
• Beacon, safe water	BCNSAW	Structure for: red and white octagonal daybeacon
• Beacon, spec purp./gen.	BCNSPP	Marker
		Measured distance markers
		Measured course markers
		Structure for: directional light
		Structure for: range lights
		Structure for: white and orange daybeacon
		Structure for: yellow daybeacon
		Structure for: yellow lights
• *See asterisk below*		Structure for: sector lights
• *See double asterisk below*		Structure for: black and white daybeacon
• *See double asterisk below*		Structure for: green and white daybeacon

* The structure for a sector light may be a beacon_lateral (BCNLAT), a beacon_isolated danger (BCNISD), a beacon, safe water (BCNSAW) or a beacon_cardinal (BCNCAR). Examine the source document to determine the correct shape and ENC S-57 beacon object to be encoded.

** Examine the source document to determine the correct shape and ENC S-57 beacon object to be encoded.

(“B” objects are continued on the following page.)

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

B (continued)

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Buoy, cardinal	BOYCAR	SEE CHART NO. 1-SECTION Q-130.3
• Buoy, installation	BOYINB	Buoys: Oil or gas installation buoy
• Buoy, isolated danger	BOYISD	Buoys: Isolated danger buoy
• *See asterisk below*	BOYLAT	Buoys: Can (cylindrical) buoy
• Buoy, lateral	BOYLAT	Buoys: Junction (preferred channel) buoy
• *See asterisk below*	BOYLAT	Buoys: Nun (conical) buoy
• Buoy, safe water	BOYSAW	Buoys: Fairway buoy
		Buoys: Red/white/ vertical stripe
		Buoys: Mid-channel buoy
		Buoys: Safe water buoy
• Buoy, spec purp./gen.	BOYSPP	Buoys: Special purpose buoy
		Buoys: ELB superbuoy
		Buoys: LANBY superbuoy
		Buoys: ODAS buoy
		Buoys: Superbuoy

* A buoy_isolated danger (BOYISD); a buoy_lateral (BOYLAT); a buoy_safe water (BOYSAW) and a buoy_special purpose/general (BOYSPP) may be in the shape of a can or a nun. Examine the source document to determine the correct shape and ENC S-57 buoy object to be encoded.

C

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Coastguard station	CGUSTA	Coastguard station

D

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Daymark	DAYMAR	Daybeacon
• Distance mark	DISMAR	Not specified in Chart No. 1 (in ENC context)

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

E

NONE

F

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Fairway	FAIRWY	Safety fairway (Not specified in Chart No. 1)
• Ferry route	FERYRT	Ferries: Ferry route
		Ferries: Ferry
		Ferries: Cable ferry
• Fog signal	FOGSIG	Fog signal

G-K

NONE

L

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Light float	LITFLT	Light float
• Lights	LIGHTS	Light

M

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Mooring/Warping facility	MORFAC	Buoys: mooring buoys
		Junction cable of a mooring trot

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

N

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Navigation line	NAVLNE	Transit line
		Channel range line: entire line (dashed and solid)
		Clearing line
		Measured distances: lines

O

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Offshore platform	OFSPLF	Offshore platform

P

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Pilot boarding place	PILBOP	Pilot boarding area (symbol) only/limits not specified)
		Pilot boarding area (limits)
• Precautionary area	PRCARE	Precautionary area

Q

NONE

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

R

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Radar line	RADLNE	Radar reference line
• Radar range	RADRNG	Radar range
• Radar reflector	RADRFL	Radar reflector
• Radar station	RADSTA	Radar surveillance station
		Coast radar station
• Radar transponder bcn	RTPBCN	Racon
		Ramark
• Radio calling-in point	RDOCAL	Calling-in Points
• Radio station	RDOSTA	Radiobeacon
• Recommended route C/L	RCRTCL	Recommended route (often marked by c/l buoys)
• Recommended track	RECTRC	Alternate Course: Not marked by aids
		Alternate Course: Marked by aids
		Channel range line: Navigable portion (solid)
		Range line: Navigable portion (solid)
		One-way track
		Recommended Course: Not marked by aids
		Recommended Course: marked by aids
• Recomm. traffic lane part	RCTLPT	TSS: Recommended direction of traffic flow
• Rescue station	RSCSTA	Refuge beacon
		Rocket station
		Lifeboat station
		Rescue station
• Retro-reflector	RETRFL	Retro-reflector

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

S

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Signal station, traffic	SISTAT	Signal Station: Traffic signal station
		Signal Station: Bridge lights incl. Traffic signals
		Signal Station: Bridge passage signal station
		Signal Station: Lock signal station
		Signal Station: Port entry and departure signal
		Signal Station: shows Intern. port traffic signals
		Signal Station: Telegraph station
		Signal Station: Port control signal station
• Signal station, warning	SISTAW	Signal Station: Storm signal station
		Signal Station: Auto. recording tide gauge
		Signal Station: Wind station
		Signal Station: Firing practice signal station
		Signal Station: Danger signal station
		Signal Station: Tidal stream signal
		Signal Station: Tidal signal station
		Signal Station: Tide scale or gauge
		Signal Station: Time signal station
		Signal Station: Ice signal station
		Signal Station: NWS signal station
		Signal Station: Distress signal station
		Signal Station: Telegraph station
		Signal Station: General
• Submarine transit lane	SUBTLN	Submarine transit line and exercise area

T

IHO S-57 Object	IHO ACRONYM	NOS Navigational Aid Feature
• Topmark	TOPMAR	Topmark
• TSS: Traffic separation line	TSELNE	TSS: Traffic separation line
• TSS: Traffic separation	TSEZNE	TSS: Separation zone
• TSS: TSS boundary	TSSBND	TSS: Traffic lanes
• TSS: TSS crossing	TSSCRS	TSS: Crossing
• TSS: TSS lane part	TSSLPT	TSS: Established (mandatory) direct. of traffic flow
• TSS: TSS roundabout	TSSRON	TSS: Roundabouts

APPENDIX - II

TRANSLATION TABLES - PART 2

IHO S57 Object *to* NOS Navigational Aid Feature

U-Z

NONE

NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division

CARTOGRAPHIC ORDER 006/02

APRIL 18, 2002

File With Nautical Chart Manual Volume 1, Part 2, Section 5.30

TO: All Cartographers
Marine Chart Division

SUBJECT: Nautical Chart Manual NOS/ENC Object Specifications (Navigational Aids) Interpreting Ambiguous Light List Information

APPLICATION: All Nautical Charts

Effective immediately, the following attachment adds to the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition, pages 5-RF_37 through 5-RF_58.

The attachment is composed of fabricated pages of the USCG Light List and is intended to provide guidelines for interpreting and encoding ambiguous Light List information.

Pages 5-RF_37 through 5-RF_58 are to be inserted into the Nautical Chart Manual, Volume 1, Part 2, Seventh (1992) Edition immediately after NOS/ENC Object Specifications page 5-RF_36.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

Introduction

The U.S. Coast Guard Light List has proven to be one of the more valuable supplemental source documents for obtaining aid to navigation attribute information. It contains information, which although previously has not been required by NOS for charting purposes is now considered of vital importance for properly encoding aids to navigation for ENC purposes.

Aids to navigation are never charted using the U.S. Coast Guard Light List as the official source (the Local Notice to Mariners, the Weekly Notice to Mariners and Form 76-40 letters from hydrographic survey Descriptive Reports remain the official source documents for the application of aids to navigation to nautical charts and the ENC database). However, Light List information such as the type of structural component, the name of the aid, the signal characteristics of a fog signal are all examples of information which may be used to encode the attributes of an aid.

Purpose

The purpose of this document is:

(a.) to provide guidelines for interpreting ambiguous U.S. Coast Guard Light List information as the information applies to the IHO/S-57 encoding of aids to navigation, but,

(b.) **TO SPECIFICALLY AND ONLY CONCENTRATE ON INFORMATION WHICH CANNOT IMMEDIATELY BE AFFILIATED WITH AN ENC OBJECT ATTRIBUTE.**

For example, column 2 of the Light List contains the name of the aid. This information would immediately be affiliated with (and therefore populated in) the S-57 attribute *Object name (OBJNAM)*.

However, column 7 of the Light List is entitled "Structure", but there is no ENC object attribute similarly entitled. The information in this column will have to be properly interpreted so that the correct ENC object attributes are identified and encoded.

General Guidelines

1. These guidelines may also be used when interpreting the Light List section of new Local Notice to Mariners which establish or revise aids to navigation.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

General Guidelines (continued)

2. The geographic position provided in Light List column 3 is a *locator* position only, and is **never** to be entered into the ENC database as the official location of the aid to navigation.

3. Specific guidelines instructing the cartographer to add a light(s) equipment object to a structural component are not provided. This ENC function should be understood.

4. **THIS DOCUMENT IS NOT INTENDED TO PROVIDE A FULL DESCRIPTION OF ALL COLUMNAR INFORMATION PRESENTED IN THE U.S. COAST GUARD LIGHT LIST. IT IS SPECIFICALLY AND ONLY BEING PROVIDED TO HIGHLIGHT ENC RELEVANT BUT ENIGMATIC LIGHT LIST INFORMATION REQUIRED FOR THE PROPER ENCODING OF AID TO NAVIGATION.**

   PLEASE REFER TO THE GENERAL INFORMATION SECTION OF THE U.S. COAST GUARD LIGHT LIST FOR DETAILED EXPLANATIONS OF ALL COLUMNAR INFORMATION AS IT APPLIES TO TRADITIONAL NAUTICAL CHARTING.

5. **IT IS STRONGLY RECOMMENDED THAT THE INDEX ON THE FOLLOWING THREE PAGES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED**.

(The remainder of this page is intentionally blank.)

IT IS STRONGLY RECOMMENDED THAT THE FOLLOWING INDEX BE USED TO LOCATE (WITHIN THE CONTEXT OF APPENDIX - I) THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

Index of Guidelines

IT IS STRONGLY RECOMMENDED THAT THE FOLLOWING INDEX BE USED TO LOCATE (WITHIN THE CONTEXT OF APPENDIX - I) THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

Index of Guidelines

IT IS STRONGLY RECOMMENDED THAT THE FOLLOWING INDEX BE USED TO LOCATE (WITHIN THE CONTEXT OF APPENDIX - I) THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

Index of Guidelines

FOR YOUR ENJOYMENT: "A Pictorial Tour of Superbuoys" ----- Pages 940 to 945

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
	SOUTH END OF LAKE GEORGIA (CHART 15097)						
	East-West Outer Channel						
6885	EAST-WEST RIVER LIGHT	42 00 00 N 83 08 30 W	Fl (2) W 6s	55 17	10	TR on post	RACON: O (– – –) HORN 1 blast ev 30s (3s bl). Operates continuously
6886	- *Lighted Buoy 2*	41 55 17 N	Q R		4	Red	
6887	- Buoy 3						

* Always use the bold heading located at the beginning of a grouping, as part of the aid name if a dash (-) precedes the specific aid listing. (See LL. No. 6886 for an example.)

* This information indicates that the rhythm of the light is Group Flashing, and that the **LIGHTS** attribute - *Signal Group (SIGGRP)* will be populated with the value two (2) to indicate the number of flashes.

* USCG Light List Vol. VII-Great Lakes publishes the height in feet and meters. The top value - 55 is in feet, the bottom value - 17 is in meters.

* The bold heading: East-West Outer Channel will be added to the name of this aid because a dash (-) precedes the listing. **[e.g., East-West Outer Channel Lighted Buoy 2.]**

* Only this portion of the label classified as a "characteristic" in the Light List will be encoded in the **LIGHTS** attribute - *Light characteristic (LITCHR).*

Green can

* This information indicates the structural component of the aid. A green can or a red nun indicates that the ENC object **Buoy, lateral [BOYLAT]** will be encoded as the structural component.

* The information will be encoded into three (3) **BOYLAT** attributes-*COLOUR, Buoy Shape (BOYSHP)* and*Category of lateral mark (CATLAM).*

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6888	- Buoy 4						Red nun
6889	- *Lighted Buoy 5*		Fl G 2.5s		4		Green
6890	ROCK CREEK ISLAND SPIT LIGHT	42 02 24 N 83 08 06 W	Q W	17	5	NR on dolphin	Ra ref.

Maintained from Apr. 1 to Dec. 21.

* This is seasonal information about the aid. It will be encoded into two (2) **BOYLAT** attributes - *Periodic date start (PERSTA)* and *Periodic date end (PEREND)*.

NOTE: When the attributes *(PERSTA)* and *(PEREND)* are used, the **BOYLAT** attribute *STATUS* **MUST** be populated with the value five (5) [i.e., periodic / intermittent].

* This value will be encoded into the **LIGHTS** attribute - *Signal period (SIGPER)*.

* This value will be entered into the **LIGHTS** attribute - *Value of nominal range (VALNMR)* and **not** the **LIGHTS** attribute - *Light visibility (LITVIS)*.

* The above statement indicates that a red and white daymark exists on a dolphin. However, the dolphin **will not** be the ENC object encoded as the supporting structure. The supporting structure in this situation shall be a beacon object (e.g. **Beacon, special purpose/general [BCNSPP]**). The dolphin shall be encoded by populating the value " 5 " (pile beacon) for the **BCNSPP** attribute *(BCNSHP)*.

* A radar reflector associated with an aid will be encoded in the **BCNSAW** attribute - *Conspicuous, radar (CONRAD)*. Radar reflectors shall only be encoded as individual objects when they are associated with linear objects (e.g., overhead cables).

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6891	*Blair Shoal Obstruction Lighted Buoy D*	42 01 36 N 83 08 06 W	Fl (2) W 5s			Black with red band and two black spherical topmarks.	
6892	- Lighted Wreck Buoy WR		Q R		3	Red	

* Do not add the bold heading to the name of this aid because a dash (-) does not precede the listing. The name of the aid will be encoded into the **BOYISD** attribute - *Object name (OBJNAM)* exactly as it is listed

* This column will contain information about the type of supporting structure to be encoded for a buoy (e.g., **BOYISD, BOYLAT**, etc.).

* This specific information indicates that the buoy structure will be encoded as the ENC object **Buoy, isolated danger [BOYISD]**.

* Buoys containing bands are said to possess a color pattern. Color patterns are encoded in the similarly named **BOYISD** attribute *Colour pattern (COLPAT)*. A black and red band indicates that the buoy contains a horizontal stripe (band) and that the attribute *COLPAT* will be populated with the value one (1) [" horizontal stripes "].

* The 2 topmarks are encoded by populating the value four (4) ["2 spheres"] in the attribute *Topmark/daymark shape (TOPSHP)*.

* This information indicates that, in addition to encoding the supporting structure and the **light [LIGHTS]** equipment object, the collection object **Association (C_ASSOC)** will (if the wreck is charted) also be encoded.

* Although the only structural information provided is the color, the structural component of a wreck buoy will always be encoded as the ENC object **Buoy, isolated danger [BOYISD]**.

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

A Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
	East-West Inner Channel						
6893	- RANGE FRONT LIGHT	42 04 12 N 83 07 24 W	Q W	20		KRW on skeleton tower on piles.	Visible all around; higher intensity on range line.
6894	- RANGE REAR LIGHT 2500 feet, 013.5° from front light		Iso W 6s	60		KRW on skeleton tower on piles.	Visible all around; higher intensity on range line.
6895	- Daybeacon 8					TR on pile.	Ra ref.

* The structure of a range light shall be encoded as the ENC object **Beacon, special purpose / general [BCNSPP]**. The skeleton tower aspect is encoded by populating the value " 4" (lattice beacon) in the **BCNSPP** attribute - *Beacon shape (BCNSHP)*.

* The piles shall not be encoded.

* " KRW " indicates that the **daymark [DAYMAR]** equipment object is rectangular red and white. These elements be encoded in the **DAYMAR** attributes *Topmark/daymark shape (TOPSHP)*. and *COLOUR*.

* A daybeacon shall always be encoded as having a beacon object as the supporting structure and a **daymark [DAYMAR]** as an equipment object.

* "TR" indicates that the **daymark [DAYMAR]** equipment object is triangular red. This information is encoded into two (2) separate **DAYMAR** attributes - *COLOUR* and *Topmark / daymark shape (TOPSHP)*.

* The pile is encoded by populating the value "5" (pile beacon) in the **BCNLAT** attribute - *Beacon shape (BCNSHP)*.

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6896	-JUNCTION LIGHT BC	42 03 06 N 83 07 48 W	Fl (2+1) R 6s	17	3	JR on pile.	Ra ref.
6897	Sun 108-2 Lighted Mooring Buoy		Fl W 4s				White
							SIGN: SUN-MP-293 -MBI. Private aid.

* Remember to add the bold heading at the beginning of a grouping when the specific listing is preceded by a dash (-).

* To obtain the name of a bold heading may require referring to previous light list pages until the beginning of the grouping is located.

* This portion of the composite light's characteristics is used to encode the **Light [LIGHTS]** attribute *Signal group (SIGGRP). (See Section 5.30.19 for more information on encoding the Signal group attribute.)*

* This information indicates that the structural component will be encoded as the ENC object **Beacon, lateral [BCNLAT]**.

* The pile is **not** the supporting structure and will be encoded by populating the value "5" (pile beacon) in the **BCNLAT** attribute *Beacon shape (BCNSHP)*.

* U. S. Coast Guard mooring buoys are generally not provided in the Light List. However, mooring buoys which are privately maintained may sometimes be listed.

* Mooring buoys are not encoded as buoys but will be encoded as the ENC object **Mooring/ Warping facility [MORFAC]**.

* The name: "Sun 108-2 Lighted Mooring Buoy" will be encoded in the **MORFAC** attribute *Object name (OBJNAM)*.

* The sign information may be encoded in the **MORFAC** attribute *Object Name (OBJNAM)*

* Information indicating the aid is privately maintained is encoded in the **MORFAC** attribute *STATUS*.

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6898	Chevron 185-6 Buoy Marks subsea installation	42 04 42 N 83 07 18 W				White with orange bands.	SIGN: CH-MP-160 Private aid.
6899	FORT SPRING RANGE FRONT LIGHT	42 05 12 N 83 07 06 W	F W	36	KRW		
6900	FORT SPRING PASSING LIGHT		F G	44		On same structure as Fort Spring Range Front Light.	

* The term “installation”, in this situation is misleading. Although the purpose of this buoy is to mark a subsea installation, it shall **not** be encoded as a installation buoy (**Buoy, installation [BOYINB]**).

* Buoys which mark subsea installations, shall have their structural component encoded as the ENC object **Buoy, special purpose / general [BOYSPP]**

* The value “ 53 " (wellhead mark) shall be populated in the **BOYSPP** attribute - *Category of special purpose mark (CATSPM)* to encode its purpose.

* This information affects 3 **BOYSPP** attributes - *Buoy shape (BOYSHP), COLOUR* and *Colour pattern (COLPAT)*.

* A buoy whose structure is indicated as being “ white with orange bands” will be encoded as having a *Buoy Shape (BOYSHP)* attribute value of one (1) [“can (cylindrical)”].

* The attribute *COLOUR* will be populated with two (2) values - “1" (white) and “ 11 " (orange).

* The attribute *COLPAT* will be populated with the value “ 1" (horizontal stripes).

* A passing light will always have been established on a principal light. In this situation, the passing light was established on a front range light (see column 7).

* The LIGHTS attribute Category of light (CATLIT) shall be populated with the value 10 (subsidiary light).

* The passing light was established on the front range light, listed as LL. No. 6899 (see above). Therefore at the official geographic position of the front range light, all of the following will be encoded:

Fort Spring Range Front Light	[LIGHTS]
Fort Spring Passing Light	[LIGHTS]
Beacon, special purpose/general	[BCNSPP]
Daymark	[DAYMAR]

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

A Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
			Michigan				
6901	QUATRE COINS ENTRANCE LIGHT	42 06 48 N 83 07 06 W	Fl W 6s	17	4	NG on dolphin	Red sector visible from 340° to 070°
6902	KESSLER BAY DIRECTIONAL LIGHT	42 06 00 N 83 07 06 W	Fl (2+1) 6s (R&G sectors)	15	4	On pile	Centerline bearing 160° White visible 3.25° each side of centerline. Red visible from 102° to 141°. Green visible from 180° to 234°.

* This is the only information which will be populated in the **LIGHTS** attribute - *Light characteristic (LITCHR)*. (See the Index of Guidelines to obtain the APPENDIX-III light list number which encodes the other (light list) column 4 characteristics.

* This information indicates that the light to be encoded is a sector light.

* However, two (2) ENC **light [LIGHTS]** objects shall be encoded at the same geographic position - one (1) for each sector represented.

* The two (2) sectors represented in the above situation are the:

  a. red sector: 340 ° to 070 °, and,
  b. white sector: 070° to 340°

(See Section 5.30.19.19 for more information on encoding ENC sector lights.)

* One (1) ENC **light [LIGHTS]** object will be encoded for each sector represented in a directional light.

* USCG Directional lights will normally have three (3) adjoining sectors - a red sector, a white sector and a green sector. Therefore, three (3) ENC **light [LIGHTS]** objects will be encoded having the same geographic position.

* This structural information is misleading. The structural component will not be encoded as a pile **[PILPNT]**, but will be encoded as the ENC object **Beacon, special purpose/general [BCNSPP].**

* The pile will be encoded by populating the **BCNSPP** attribute - *Beacon shape (BCNSHP)* with the value " 5 " (pile beacon).

USCG directional lights (3 sectors only) SHALL NOT be encoded as directional lights for ENC purposes. USCG (3 sectored) directional lights SHALL be encoded in accordance with the same procedures used for encoding a USCG sector light. See Section 5.30.19.6 for encoding guidelines concerning those directional lights having more than 3 sectors.

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6903	*WAVE POOL ISLAND CARDINAL LIGHTED BUOY AM*	42 54 19 N 82 27 44 W	Q W			Black and yellow, marked "AM".	Winter spar.
6904	*NOAA Lighted Buoy 41315 (ODAS)*	42 05 48 N 83 06 48 W	Fl (4) Y 20s			Yellow disc buoy with mast.	Maintained by National Oceanic and Atmospheric Administration.

* The U.S. Coast Guard does not deploy cardinal aids to navigation. However, cardinal aids are deployed in Canadian waters. Therefore, some cardinal aids may be charted on those NOS charts containing overlapping Canadian coverage.

* This structural component of a cardinal buoy shall be encoded as the ENC object **Buoy, cardinal [BOYCAR].**

* NOS does not chart the actual colors of cardinal aids (the colors are only indicated in the associated label). However, the official colors as indicated above shall be encoded in the **BOYCAR** attribute COLOUR.

* A "black and yellow" structure indicates that the **BOYCAR** attribute *Category of cardinal mark (CATCAM)* will be populated with the value 1 ("north cardinal mark").

* The name of this buoy indicates that it is an **O**cean **D**ata **A**cquisition **S**ystem superbuoy.

* The typical information required to encode the structural component of an ODAS superbuoy, is generally not provided in column 7 of the Light List. Very often the name (listed in Light List column 2) will be the only indicator of the correct ENC object to encode.

* The structure of an ODAS buoy will be encoded as the ENC object **Buoy, special purpose/general [BOYSPP]**.

* To specify that the superbuoy is an ODAS buoy, the **BOYSPP** attribute - *Category of special purpose mark (CATSPM)* will be populated with the value " 9 ". The **BOYSPP** attribute - *Buoy shape (BOYSHP)* will be populated with the value " 7"(super- buoy).

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6905	*- Anchorage Area Bravo Tanker Terminal Lighted Buoy A*	42 06 06 N 83 08 48 W	Q Y			Yellow	Three lighted fluorescent orange fuel lines extend 840 feet from the buoy. Private aid.
6906	Blunts Reef Lighted Horn Buoy 2B (ELB)	42 06 54 N 83 06 42 W	Fl R 2.5s		5	Red	HORN: 1 blast ev 30^{s} (3^{s} bl). Operates continuously.

* The name of this buoy indicates that the buoy is a SPM (single - point mooring) superbuoy.

* The typical information required to encode the structural component of an SPM superbuoy, is generally not provided in column 7 of the Light List. Very often the name (listed in Light List column 2) or the information provided in Light List column 8 will be the only indicators of the correct ENC object to encode.

* The structural component of an ODAS buoy will be encoded as the ENC object **Buoy, installation [BOYINB]**.

* To specify that the superbuoy is an SPM, the **BOYINB** attribute - *Category of installlation buoy (CATINB)* will be populated with the value " 2 " [single buoy mooring (SBM or SPM)]. The **BOYINB** attribute-*Buoy shape (BOYSHP)* will be populated with the value " 7" (super - buoy).

* This information will also be an indication that a **BOYINB** object should be encoded.

* This information may be encoded in the **BOYINB** attribute - *Information (INFORM).*

* Large Automatic Navigational Buoys (LNB / LANBY) are currently being replaced by Exposed Location Buoys (ELB). ELBs are more rigid than LNBs and therefore survive better in rough weather.

* The structural component of an Exposed Location Buoy (ELB) shall be encoded as the ENC object **Buoy, special/ purpose/general [BOYSPP]**.

* An ELB does not currently exist as an attribute value for the mandatory **BOYSPP** attribute -*Category of special purpose mark (CATSPM)* , therefore the value " 15 " (LANBY / Large Automatic Navigational Buoy) shall be populated as the associated category until the ELB category is officially added to the IHO/S-57 Object Catalogue.

IT IS STRONGLY RECOMMENDED THAT THE INDEX OF GUIDELINES BE USED TO LOCATE THE SPECIFIC GUIDELINE DESIRED.

APPENDIX - III

Interpreting Ambiguous USCG Light List Information for ENC Encoding

(For instructional purposes only.)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	Michigan						
6907	Portland Lighted Horn Buoy P (LNB)	42 07 18 N 83 06 54 W	Fl W 2.5s	42	14	Red	HORN: 1 blast ev 30^{s} (3^{s} bl). Passing light (F W) nominal range 8 miles RACON: M (- -).

* The abbreviation " LNB " indicates that this buoy is a **L**arge **A**utomatic **N**avigational **B**uoy (i.e., LANBY superbuoy).

* The structural component of a " LANBY " shall be encoded as the ENC object **Buoy, special purpose/general [BOYSPP]**.

* These three features, the horn, the passing light and the RACON will be encoded as three (3) separate ENC objects. However, they shall all be encoded at the same geographic position.

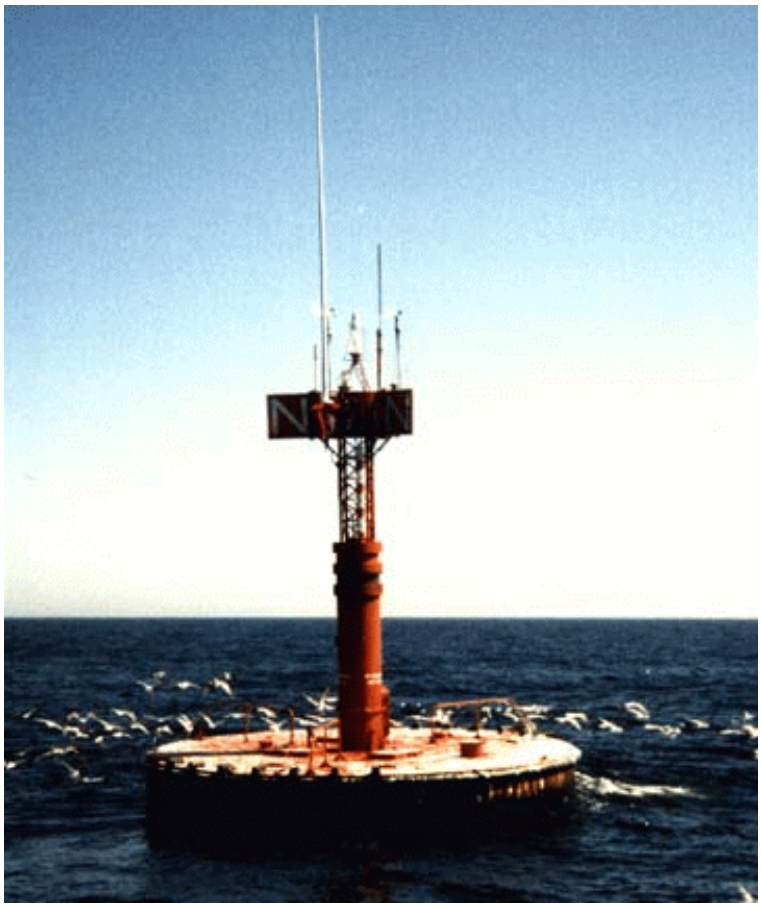
* The horn will be encoded as the ENC object **Fog signal [FOGSIG]**. The passing light will be encoded as the ENC object **light [LIGHTS]** and the RACON will be encoded as the ENC object **Radar transponder beacon [RTPBCN]**.

* (See Section 5.30.17 - Fog Signals to obtain the encoding procedures for each element of the horn.)

NOTE: Due to high costs and difficult maintenance requirements, Large Automatic Navigational Buoys are currently being replaced by the more efficient and more rigid Exposed Location Buoys (ELB). *(See Light List No. 6906 on the previous page for an example.)*

APPENDIX - III

A Pictorial Tour of Superbuoys



Large Navigational Buoy (LNB/LANBY)

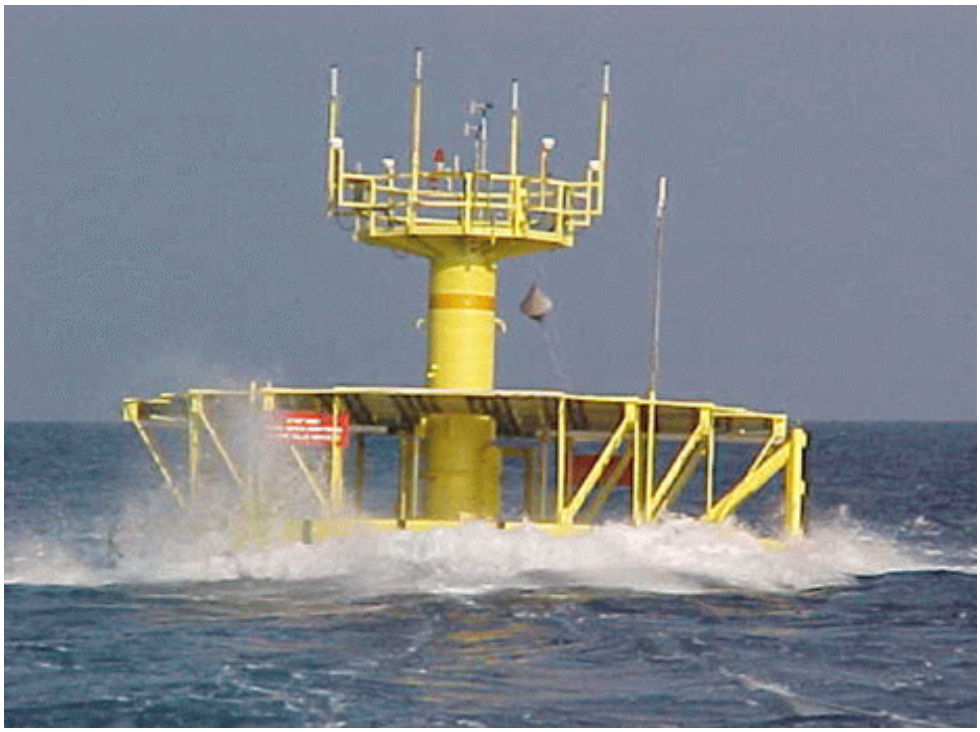
Figure 5-ES122

All Photos Courtesy of the National Data Buoy Center
http:// seaboard.ndbc.noaa.gov

APPENDIX - III

A Pictorial Tour of Superbuoys

NOAA Data Lighted Buoy 46035 - Bering Sea



(12 meter discus shaped)

Figure 5-ES123

LISTING (OF ABOVE BUOY) FROM 2001 UNITED STATES COAST GUARD LIGHT LIST (VOLUME VI - PACIFIC COAST and PACIFIC ISLANDS)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
BERING SEA -Seventeenth District							
1481	*NOAA Data Lighted Buoy 46035*	56 57 42 N 177 44 00 W	Fl (4) Y 20s			Yellow disc shaped hull.	Maintained by National Oceanic and Atmospheric Administration.

APPENDIX - III

A Pictorial Tour of Superbuoys

NOAA Lighted Buoy 42002 - Texas

Ocean Data Acquisition System (ODAS)
(10 meter discus shaped)

Figure 5-ES124

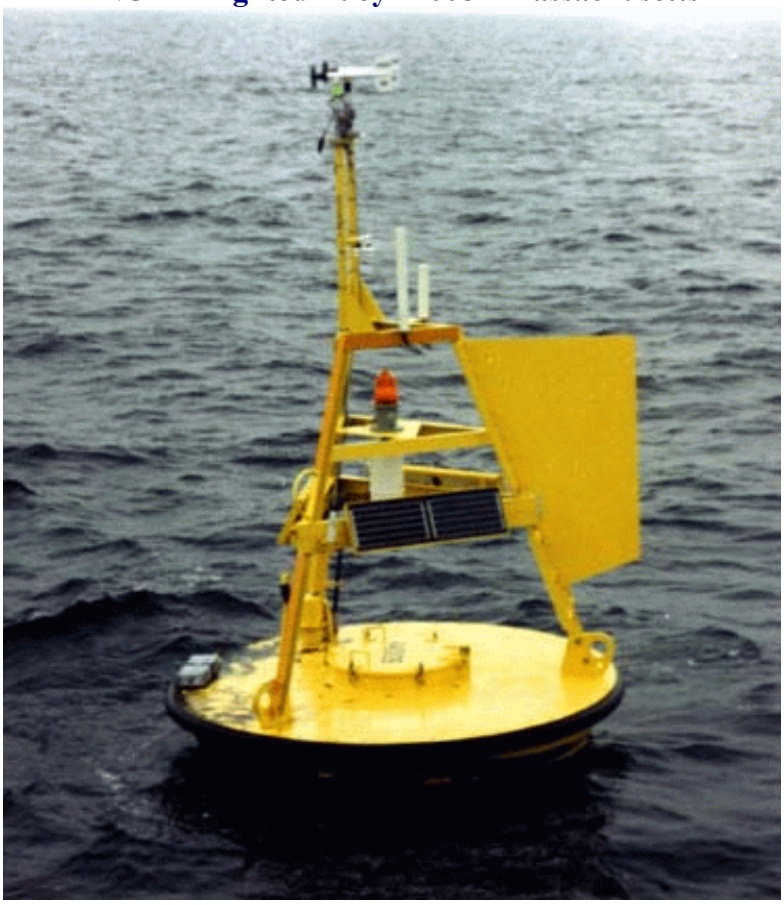
LISTING (OF ABOVE BUOY) FROM 2001 UNITED STATES COAST GUARD LIGHT LIST (VOLUME IV-GULF OF MEXICO)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
GULF OF MEXICO (Central Part) - Eighth District							
1405	*NOAA Lighted Buoy 42002(ODAS)*	25 53 30 N 83 06 48 W	Fl (4) Y 20s	33	5	Yellow disc buoy with mast.	Maintained by National Oceanic and Atmospheric Administration.

APPENDIX - III

A Pictorial Tour of Superbuoys

NOAA Lighted Buoy 44008 - Massachusetts



(3 meter discus shaped)

Figure 5-ES125

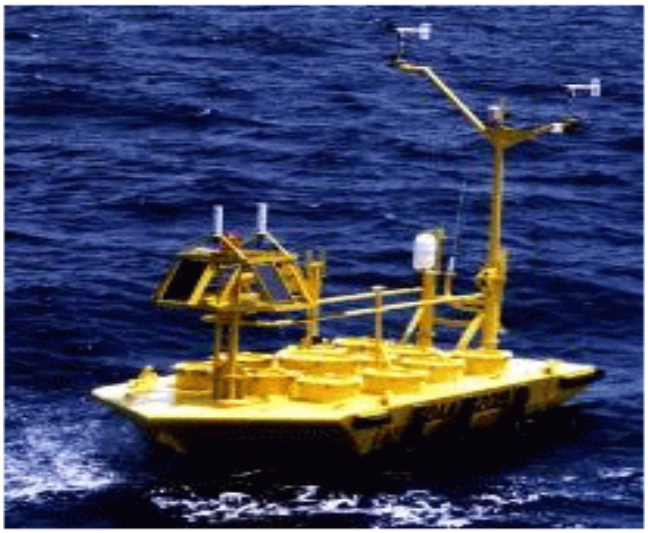
LISTING (OF ABOVE BUOY) FROM 2001 UNITED STATES COAST GUARD LIGHT LIST (VOLUME I - ATLANTIC OCEAN)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
GULF OF MEXICO (Central Part) - Eighth District							
827	*NOAA Lighted Buoy 44008*	40 30 00 N 69 25 00 W	Fl (4) Y 20s			Yellow disc buoy with mast.	Maintained by National Oceanic and Atmospheric Administration.

APPENDIX - III

A Pictorial Tour of Superbuoys

NOAA Lighted Buoy 44011 - Maine



Ocean Data Acquisition System (ODAS)
(6 meter boat shaped)

Figure 5-ES126

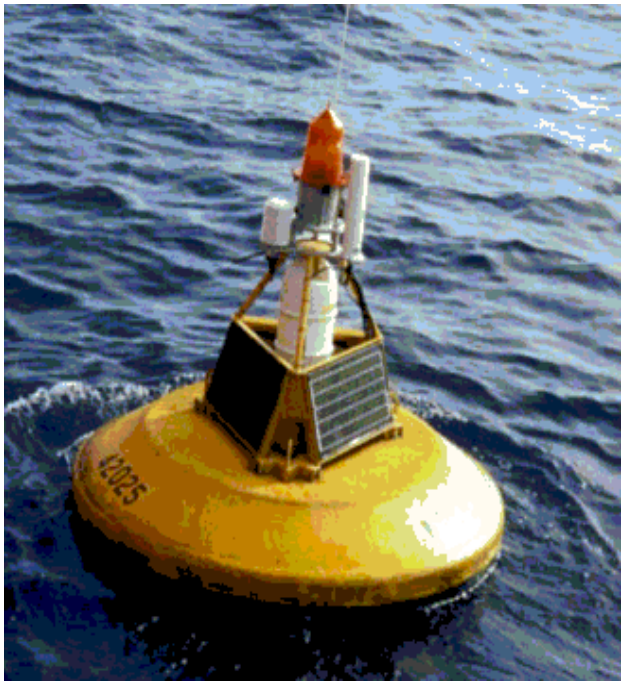
LISTING (OF ABOVE BUOY) FROM 2001 UNITED STATES COAST GUARD LIGHT LIST
(VOLUME I - ATLANTIC COAST)

(1) No.	(2) Name and Location	(3) Position	(4) Characteristic	(5) Height	(6) Range	(7) Structure	(8) Remarks
	SEACOAST (Atlantic Ocean)						
825	*NOAA Data Lighted Buoy 44011(ODAS)*	41 05 30 N 66 35 30 W	Fl (4) Y 20s			Yellow boat shaped buoy.	Maintained by National Oceanic and Atmospheric Administration.

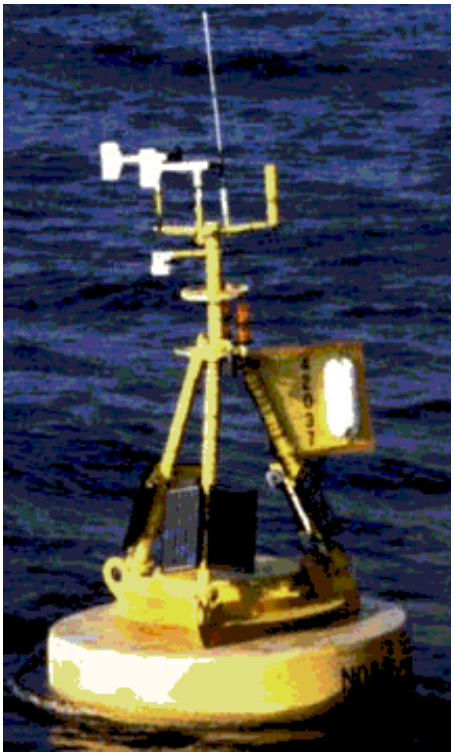
APPENDIX - III

A Pictorial Tour of Superbuoys

Newest Types of NOAA Weather Buoys Currently Being Deployed



Coastal Oceanographic Line-of-Sight (COLOS) Buoy



Coastal Buoy

Figure 5-ES126